CLAIMS

What is Claimed is:

1. An interrogator for an inductively coupled identification system, comprising:

a first coil adapted to generate a first magnetic field component;

a second coil adapted to generate a second magnetic field component, wherein said first and second magnetic field components form a composite magnetic field;

a driver for driving said first and second coil, said driver coupled to said first and second coils and providing at least one signal to generate said first and second magnetic field components;

a detector for detecting a transponder signal modulated on either said first or second magnetic field component; and

a processor for processing said signal detected from said transponder.

2. The interrogator of Claim 1, wherein said driver further comprises providing a first signal having a first phase to said first coil and providing a second signal having a second phase to said second coil to generate said first and second magnetic field components.

3. The interrogator of Claim 1, further comprising:

a first capacitor having a first end and a second end opposite said first end, said first end of said first capacitor coupled to a first end of said first coil, said second end of said first capacitor coupled to a second end of said first coil; and

a second capacitor having a first end and a second end opposite said first end, said first end of said second capacitor coupled to a first end of said second coil, said second end of said second capacitor coupled to a second end of said second coil.

4. The interrogator of Claim 3, further comprising:

a third capacitor having a first end and a second end opposite said first end, said third capacitor disposed between said first coil and said driver, said first end coupled to said driver, said second end coupled to said first end of said first coil; and

a fourth capacitor having a first end and a second end opposite said first end, said fourth capacitor disposed between said second coil and said driver, said first end coupled to said driver, said second end coupled to said first end of said second coil.

5. The interrogator of Claim 1, further comprising:

a first capacitor having a first end and a second end opposite said first end, said first capacitor disposed between said first coil and said driver, said first end of said first capacitor coupled to said driver, said second end of said first capacitor coupled to a first end of said first coil; and

a second capacitor having a first end and a second end opposite said first end, said second capacitor disposed between said second coil and said driver, said first end of said second capacitor coupled to said driver, said second end of said second capacitor coupled to a first end of said second coil.

6. The interrogator of Claim 1, wherein said first coil is perpendicular to said second coil.

7. The interrogator of Claim 1, wherein said detector further comprises a pickup coil perpendicular to said first and second coils.

8. The interrogator of Claim 1, wherein said driver further comprises:

an oscillator adapted to generate a first signal at twice a carrier frequency;

a phase splitter coupled to said oscillator and adapted to split said first signal into an in-phase component and a quadrature phase component at said carrier frequency; and

wherein said in-phase component is provided to said first coil and said quadrature phase component is provided to said second coil.

9. The interrogator of Claim 1, wherein said processor further comprises:

at least one potentiometer coupled to said detector and adapted to nullify interference on said detected signal;

an amplifier coupled to said at least one potentiometer and adapted to amplify said detected signal;

a filter coupled to said amplifier and adapted to filter said detected signal;

a demodulator coupled to said filter and adapted to demodulate said detected signal;

at least one decoder coupled to said demodulator and adapted to decode said demodulated signal; and

a processor coupled to said at least one decoder and adapted to process said decoded signal.

10. The interrogator of Claim 1, further comprising a display coupled to said processor, wherein said processor provides said processed signal to said display, said display adapted to display said processed signal in a format understandable by a user.

11. The interrogator of Claim 1, further comprising an audio transducer coupled to said processor, said audio transducer adapted to receive a signal from said processor and produce an audible tone when a transponder is detected.

12. The interrogator of Claim 1, further comprising a third coil adapted to generate a third magnetic field component, said driver further coupled to said third coil and driving said third coil with a first signal to generate said third magnetic field component to precess said composite magnetic field.

13. The interrogator of Claim 12, wherein said third coil is perpendicular to said first and second coil.

14. The interrogator of Claim 12, further comprising a first capacitor having a first end and a second end opposite said first end, said first capacitor disposed between said third coil and said driver, said first end coupled to said driver, and said second end coupled to a first end of said third coil.

15. The interrogator of Claim 14, further comprising a second capacitor having a first end and a second end opposite said first end, said second capacitor disposed between said first capacitor and said third coil, said first and second end of said second capacitor coupled to a first and second end of said third coil, respectively.

16. The interrogator of Claim 12, further comprising a first capacitor having a first end and a second end opposite said first end, said first capacitor disposed between said driver and said third coil, said first and second end of said first capacitor coupled to a first and second end of said third coil, respectively.

17. A method for interrogating a transponder for an inductively coupled identification system, said method comprising the steps of:

providing at least two coils for generating a corresponding magnetic field component for each of said at least two coils, wherein said corresponding magnetic field components form a composite magnetic field having a varying phase and substantially constant amplitude;

driving said at least two coils with at least one signal to generate said composite magnetic field, wherein each one of said coils generates said corresponding magnetic field component offset in phase by a certain degree relative to said corresponding magnetic field component of an adjacent said coil;

aligning said at least two coils relative to each other and relative to said degree of offset in phase of said corresponding magnetic field components, to provide proper orientation of said composite magnetic field;

detecting a transponder signal modulated on said composite magnetic field; and

processing said transponder signal.

18. The method of Claim 17, further comprising the step of providing an audio tone when said transponder signal is detected.

19. The method of Claim 17, further comprising the steps of:

providing a series drive capacitor for each said coil through which said coil is driven; and

providing a parallel tank capacitor for each said coil, wherein said series drive capacitor and said parallel tank capacitor provide an impedance matching network.

20. The method of Claim 17, further comprising the step of providing a precession coil for generating a magnetic field component to precess said composite magnetic field, said precession coil aligned relative to said at least two coils and driven with a signal offset in frequency from said at least one signal driving said at least two coils.

21. An emitter for an inductive coupling device, comprising:

a driver circuit;

an inductor having first and second ends, said inductor adapted to generate a magnetic field;

a capacitor having first and second ends, said first and second ends of said capacitor coupled to said first and second ends of said inductor, respectively; and

a series drive capacitor having first and second ends, said second end of said series drive capacitor coupled to said first end of said inductor, said first end of said series drive capacitor adapted to couple to said driver circuit which energizes said inductor.

22. A method of providing an impedance matching network for a coil in an electrical device, comprising the steps of:

providing a desired resonance frequency for a coil and a required load impedance;

determining the required capacitance and inductance;

determining a ratio of drive impedance to a resistance of said coil; and

determining an approximate value for a capacitor in parallel with said coil and an approximate value for a drive capacitor in series with said capacitor and said coil.